Survey of Bio.

Wk. 12

Thripp
Survey
Pg. 1

WED, 2009-11-18, 8-9:20 AM.

Test 1 = 100 pts
Test 2 = 100 pts.
Test 3 = 100 pts.
Test 4 = 100 pts. (ch. 15-17)
Cumulative = 100pts. – replaces one lower grade, curved somewhat = 500 pts. + several extra
4+ students who have over 100!

Did review or T2 = A, B, C = 28/31
Did review or T2 = D, E = 13 of 29

Don't give up, you can make up 60% of your grades w/ the last 2 tests in wk. 16. Don't drop the class unless you are failing

Ch. 14: Only the taxonomy part.

☺ Taxonomy = naming by appearance.

Carolus Linnaeus (Swedish) ~~discovered~~ developed the taxonomic naming system

* Each species has a two-part name: genus and species

Homo sapiens ← Species must be lowercase
↑ Genus must be capitalized

Entire name must be italicized or underlined.

⊘ homo sapiens: wrong (not capitalized)
⊘ sapiens: wrong (must have genus)
⊘ Homo sapiens: wrong (underline or italicize)
✓ Homo sapiens: right!

Domain
Kingdom
Phylum
Class
Order
Family
Genus Species

Eukarya → Animalia → Chordata → Mammalia → Carnivora → Felidae → Panthera → Panthera pardus

DKPCOFGS
Does King Phillip Come Only From Good Stock?
Do Keep Piling Chocolate On For Goodness Sake
Do Kangaroos Play Cards On Fat Green Stools?

☺ More than ½ our antibiotics come from soil bacteria

~~Carnivora~~

WED, 2009-11-18 8-9:20 AM.

Prokaryotes are everywhere! Sour-dough bread is made from growing bacteria. In 1970, the USDA discovered the bacteria that makes bread sour. Milk & cheese require bacteria for flavor, & cows need bacteria for their stomachs.

Prokaryotes existed 2 billion years before eukaryotes.

What did early life look like? Archaeas give us information. They live in salt & brine, others live in high pressure, others live near boiling water. Iron oxide on underwater rock faces means archea were excreting oxygen, which eventually made our atmosphere.

Prokaryotes reproduce by binary fission — no mitosis because prokaryotes have no chromosomes & no nucleii — DNA is in a region of the cytoplasm called the nucleoid.

Most prokaryotes are Domain Bacteria — i.e an ear infection.

Domain Archaea is more related to eukarya than bacteria.

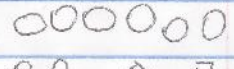
Bacteria → Archea → Eukarya

☺ Dr. Backer used to grow yeast. One bacteria would outgrow the yeast the next day.

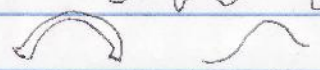
Domain Archaea are extreme — they inhabit extreme environments. Halophiles thrive in salt, thermophiles inhabit very hot water — like Yellowstone National Park.

☺ Morning glory pool @ Yellowstone — bacteria could grow at cooler edges.

3 shapes of bacteria

Coccus — round or spherical (circular) 

Bacillis — Brick or rod shaped 

Spirochetes — Spiral shape 

WED, 2009-11-18, 8-9:20 AM.

☺ Bacteria can be used to treat sewage or clean oil spills.
Bacteria supply nitrogen & carbon, they make us well & sick
They break down our food line our mouths, skin, alimentary canal,
and make fake snow! They fill space quickly. ☺ There might be
a protein that can shut down bacteria.

Exotoxins are poisonous proteins exported out of the bacterial cell
Endotoxins are poisonous part of the cell walls of certain bacteria.
→ Botulism in canned goods will kill you — also: Botox to paralyze
your skin.

nutritional type	energy source	carbon source
Photoautotroph	sunlight	CO_2
Chemoautotroph	inorganic chemicals	CO_2
Photoheterotroph	sunlight	organic compounds
Chemoheterotroph	organic compounds	organic compounds

Photoautotrophs: photosynthetic (light energy), CO_2 as carbon source,
includes Plantae & ~~Kingdom~~ cyanobacteria
Chemoautotrophs: Energy from inorganic substances, CO_2 as carbon source
includes some bacteria & archea.
Photoheterotrophs: light energy, carbon from organic molecules.
→ no example questions on test
Chemoheterotrophs: organic molecules for both energy & carbon source
includes Fungae and Animalia (i.e. humans)

Kingdom Protista: are eukaryotic, most are unicellular
some animals are in protista. Some protista have flagella —
called flagellates. Ciliates have cilia.
Amoebas ingest food by engulfing (surrounding) it.

WED, 2009-11-18, 8-9:20 AM. Unicellular algae are photosynthetic Protista. They have dinoflagellates. Green algae are ancestors of land plants (!).

They are unicellular & colonial. (like colonies — not joined)

Seaweeds: green algae, red algae, & brown algae (multi-cell Protista)

☺ Carageenan is a slimy carb. from red algae used as a thickener

Some algae is edible.

THU., 2009-11-19, 2-3 PM: As of Test 1 & 2

A or B: 23 of 26 did review 1

C or D: 17 of 25 did review 1 or 2 (8 did not)

F: 3 of 17 did review 1 or 2 (13 did not)

Dr. Backer is proud of this class — most 100+ scores (6) out of all sections.

Taxonomy pgs. 287-289. We are Homo genus but our species is Homo sapiens — we are not just sapiens.

Homo sapiens is wrong (needs underlined or italicized)

Chordata is a phylum. (DKPCOFGS) (mostly backbones)

Felis catus is the species name of a cat.

Do Keep Piling Chocolate On For Goodness Sake } mnemonics
Dear King Paul Came Over From Greece Saturday }

Memphitis memphitis → (striped skunk) Lutra lutra → (European otter) so no conflicts w/ say Memphitis darwinius (made-up example) → double name genus species

Bacilli bacteria (singular: bacillis) makes sour-dough taste sour.

Bacteria makes cheese, milk & other food flavorful. We need bacteria to live — to digest our food, for example

Archaea not Archea... oops

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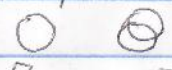
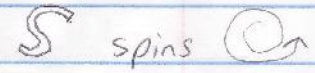
Pg. 5

THU, 2009-11-19, 9:30-10:50 AM:

4.5B years ago the Earth was lifeless magma. Meteors striking the Earth made our planet's iron core.
3.8B years ago the oceans began to form & the Earth cooled
Archaea live in harsh conditions — i.e. 200 ft below the surface at → 212°F (boiling point of water) Cyanobacteria made oxygen by photosynthesis first, making rocks rust (iron oxidation) and creating the oxygen atmosphere. Plants evolved later.
Archaea live by eating inorganic chemicals. Larger plants feed off the archaea. Binary fission is how bacteria & archaea reproduce — there is no nucleus so NO mitosis or meiosis.
DNA in prokaryotes (bacteria/archaea) is in the cytoplasm in the nucleoid.
halophile = salt-lover (archaea) → Their enzymes work well at
thermophile = heat-lover (archaea) high temperatures.
Coccus = think circle → then sphere 
Bacillus = think brick → then rod 
Spirochetes = think spiral → then S-shaped 
☺ If bacteria can eat oil spills, they could mess up our oil wells. Bacteria can grow very quickly, come in all shapes are small, and do many things. Most are beneficial to us. cycling nutrients, causes diseases, (bacteria) do both
exotoxins = poisonous proteins exported out of the bacteria
endotoxins = poisonous part of the cell walls of certain bacteria
Lyme disease = caused by a tick. Chemoautotrophs include archaea.
All Plantae are photoautotrophs.

THU, 2009-11-19, 9:30-10:50 AM:

Photoheterotrophs — no examples in class. Dr. Backer recalls a Protista that can use CO_2 or cyanic acid.

☺ If we eat sugar only, we can't make proteins.

Chemoheterotrophs include all Animalia & Fungae!

You can't kill flagellated Protista with anti-biotics.

☺ Amoebas eat by engulfing, have a translucent part of cell membrane

☺ Seaweeds are multicellular large protistas.

Ch. 16 ☺ Coniferous forests are productive for paper & wood pulp. In MN & WI, 95% of the forest was cut down after the Civil War. Cutting 1% of the forest each year will be sustainable. ☺ Clear-cutting has become commonplace, but then bacteria & fungae in the soil dies, so the land dies.

Plants are multicellular eukaryotes that photosynthesize.

Algae is supported ~~plants~~ by surrounding water. It performs photosynthesis, absorbs water, CO_2, & minerals from the water. But algae has no waxy cuticle.

All Plantae have a waxy cuticle! This prevents water loss for the above-ground parts. However, not all plants have leaves or roots. The cuticle prevents water loss on the leaves, stock, etc.

Plantae: reproductive adaptation: embryo is retained inside the female parent.

Green algae are closest to plants. (by DNA) But they don't have a waxy cuticle (mostly).

Plantae evolved from the charophyceans.

Gymnosperms = pine trees.

THU, 2009-11-19, 12:30-1:50 PM:

Carolus Linnaeus: developed taxonomy. Species names are italicized or underlined, genus is capitalized, species is lowercase
Panthera pardus = species of panthera
☺ More than half our antibiotics came from one genus of soil bacteriam.
☺ "Starter" dough starts the growth of bacteria to make sour-dough bread (mother bread). ☺ "Eyes" in cheese are tasty bacteria
Some Archaea live 200 ft. below the surface of the Earth & eat rocks. — chemoautotrophs. (CO_2 for carbon & inorganic substances for energy). Bacteria can divide much quicker than yeast (Protista).
Binary fission, DNA in nucleoid — bacteria & archaea (prokaryotes)
Archaea = extreme team. They are closer to Eukarya than Bacteria (!) Archaea are hard to grow because they require very high temperatures, i.e. 205° F.
The morning glory pool at Yellowstone is cooler at the edges so bacteria grow there. Archaea thrive in the hotter middle
Coccus = round or spherical (bacteria are 3-dimensional) O O
Bacillis = brick or rod ▭ ▬
Spirochetes = S or spiral-shaped
Watch out for botulism — an organism eats food in a can (no oxygen there) and the can puffs out from CO_2 and releases toxins which remain after cooking. If you eat botulism your diaphragm will be paralyzed and you will die
Photoautotrophs use sunlight & CO_2 (Plantae)
Chemoautotrophs use inorganic chemicals & CO_2 (some archea & bacteria)
Photoheterotrophs use sunlight & organic compounds
Chemoheterotrophs use organic compounds for energy & carbon
↳ Animalia & Fungae

THU, 2009-11-19, 12:30-1:50 PM:

Kingdom Protista are eukaryotic and mostly unicellular except algae (green, red, brown) which are multicellular eukaryote Protistas. ☺ Trumpet-shaped Protista uses cilia to move around ☺ An amoeba is a protista. Some unicellular algae have glass in them which remains after death

colonial green algae

↗ seaweeds

Red / green / brown algae = multicellular protista

☺ Carageenan is a slimy carb. from red algae — used as a stabilizer & thickener in foods, medicine, & cosmetics.

Protista aren't plant-like enough

Algae have no roots — they get nutrients from the water.

Kingdom Plantae: embryo is retained in the female parent.

green algae is closest to kingdom Plantae

↳ = ~~caro~~ charophyceans

Plants evolved as follows: Bryophytes (mosses) → seedless vascular plants (ferns) → gymnosperms (conifers) — first seed plants → angiosperms (flowers)

~~END~~

END